

Weapons of Mass Destruction and United States NBC Defense
Readiness: Has America Provided the Attacker Asymmetric
Advantage?

A Monograph

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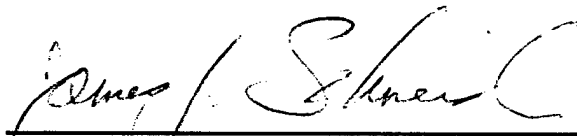
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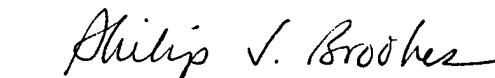
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ABSTRACT

WEAPONS OF MASS DESTRUCTION AND UNITED STATES NBC DEFENSE READINESS: HAS AMERICA PROVIDED THE ATTACKER ASYMMETRIC ADVANTAGE? by MAJ Scott D. Kimmell, USA, 51 pages.

Much of today's contemporary military writing, official literature and discussion focuses on structuring the United States military to meet the challenges of the twenty-first century. Included in this effort is much concern about the concept of asymmetrical warfare. Recognized examples of asymmetric warfare include weapons of mass destruction, terrorism and information operations. The use of weapons of mass destruction, conventionally or unconventionally, poses a significant challenge to the US government and military. Given the United States nuclear arsenal and its capability to handle biological and chemical weapons, are WMD asymmetrical to the United States? America's possible shortcomings in NBC defense readiness could create asymmetry favoring an attacker. This monograph explores the definition of asymmetric warfare, its relationship to the US NBC defense readiness, and assesses whether a biological or chemical attack against the US should be considered asymmetric.

This monograph begins by examining the published definitions of asymmetry and asymmetric warfare as they exist in contemporary literature and official documents. In addition, NBC defense readiness is analyzed to determine the level of readiness that creates asymmetry in relation to weapons of mass destruction. From this review and analysis a definition of asymmetric warfare is developed. The definition and its components serve as the evaluation criteria to judge whether WMD use against the US would be truly asymmetric. Case studies serve as the test environments or experiments (Operation Desert Storm and the 1996 Summer Olympic Games in Atlanta, Georgia). Each case study was selected based on its potential for WMD volatility. Although in both cases no US troops or civilians were exposed to WMD, planning considerations and force protection measures were serious concerns.

Lastly, the case studies are analyzed with regard to the developed definition to determine if WMD attacks in either case study would be considered asymmetric. Analyses of Operation Desert Shield/Storm and the 1996 Summer Olympic Games in Atlanta proved beneficial in obtaining a realistic view of US NBC defense preparedness against a WMD attack. Both studies revealed substantial deficiencies with respect to meeting established standards of NBC defense preparedness, which created vulnerability to asymmetric attack using weapons of mass destruction. A review of current federal, state and local actions to mitigate these deficiencies are discussed at the close of the monograph.

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Introduction

“Woe to the government, which, relying on half-hearted politics and a shackled military policy, meets a foe who, like the untamed elements, knows no law other than his own power. Any defect of action and effort will turn to the advantage of the enemy, and it will not be easy to change from a fencer’s position to that of a wrestler. A slight blow may then often be enough to cause a total collapse”¹

This passage from *On War* by Carl von Clausewitz holds significant meaning as the United States prepares itself, militarily, to launch into the next millennium as the world’s remaining superpower. The impending question that must be answered is, obviously, how might a potential adversary effect that “slight blow?”

Much of today’s contemporary military writing, official literature and discussion focuses on structuring the United States military to meet the challenges of the twenty-first century. Included in this effort is much concern about the concept of asymmetrical warfare. However, in order to fight and win under these conditions, or against these types of threats, one must understand what they are. Furthermore, asymmetric warfare must be adequately defined.

Several official documents and papers address this issue and conclude that because of US conventional military dominance potential adversaries may use unconventional approaches to avoid US strengths and exploit vulnerabilities. Today’s definition of asymmetry appears to emphasize warfare that seeks to avoid an opponent’s strength and focus on existing weaknesses. Recognized examples of asymmetric warfare include weapons of mass destruction, terrorism and information operations.

The use of weapons of mass destruction, conventionally or unconventionally, poses a significant challenge to the US government and military. The psychological fear they instill in the human psyche is unparalleled. Furthermore, this threat is not a new

problem and one that will not diminish in the near future.

Weapons of mass destruction, specifically chemical weapons, can be traced back to the Peloponnesian War in the fifth century B.C., when the Athenians and Spartans used sulfur fumes when conducting sieges against fortified cities.² In 673 A.D. the Emperor Constantine Pogonatus used a form of napalm when the Sarcens besieged Constantinople. Over 500 years later the Moslems used a similar weapon against the Christians in 1190 in the siege of Acre.³ As early as 1762 the Germans employed asphyxiating gas during a siege of the Austrian held Silesian fortress of Schweidnitz.⁴

General Pershing declared at the close of the World War I, "Whether or not gas will be employed in future wars is a matter of conjecture, but the effect is so deadly to the unprepared that we can never afford to neglect the question."⁵ WWI marked the height of chemical weapons use as belligerents attempted to break the stalemate caused by the dramatic changes in land warfare. Since WWI the use of WMD has been intermittent. Italy used chemical weapons in their war with Ethiopia, and Japan in their war with China. In WWII the Germans used poisonous gases in their concentration camps and stockpiled enormous amounts of chemical agents. However, except for the U.S. employment of atomic weapons in Japan, WMD were not used in WWII. After WWII Egypt used chemical weapons during the civil war in Yemen from 1963-1967. In Vietnam the US Army used tear gas and defoliants. The Iran-Iraq War marked the most widespread use of chemical weapons since WWI.

However, the most recent employment of weapons of mass destruction occurred in the form of non-state actors/terrorist organizations. The use of Sarin gas by the Aum Shinrikyo (Supreme Truth) in Japan turned possibility into reality. Although the threat of

similar incidents occurring remains low by US intelligent sources, the development of a WMD requires less effort and resources than one would like to believe.

The October 1998 National Security Strategy for a New Century (NSS) establishes the United States intent with regard to asymmetric threats and the dire need to plan and prepare for them. The NSS states that the US must be able to fight and win under conditions where an adversary might use asymmetric means. These unconventional approaches will avoid US strengths and exploit vulnerabilities. US conventional dominance will likely force future enemies to employ asymmetric means, such as WMD.

The US participates in operations worldwide, ranging from warfighting to humanitarian relief. Hostile nations involved in these smaller contingency operations equipped with chemical weapons may decide to employ them to prevent the United States from meeting its objectives. Several nations are known or suspected to have offensive chemical weapons programs. These nations have not signed/ratified the Chemical or Biological Warfare Convention and are located in proximity to areas in which the US has conducted contingency operations. These nations include Egypt, Iraq, Libya, North Korea, Serbia/Montenegro and Syria. Another threat to US military forces and citizens comes from non-state players, terrorist groups and fringe organizations intent on disrupting US efforts in achieving interests. The technology to produce lethal chemical weapons is well known and widely available. Sponsorship from a rogue nation can facilitate terrorist development of both chemical and biological agents. Employment of chemical weapons can come in various forms and occur throughout the spectrum of possible US military missions.

Whether at home or abroad, the United States has taken measures to protect itself from employment of WMD. Due to these actions, one could argue that an attack against the US using WMD would be attacking strength, not vulnerability. Given the United States nuclear arsenal and its capability to handle biological and chemical weapons, are WMD asymmetrical to the United States?⁶ Merely acknowledging the threat and making halfhearted preparations to deal with WMD are not enough to mitigate it. America's possible shortcomings in NBC defense readiness could create asymmetry favoring an attacker. The research question explores the definition of asymmetric warfare, its relationship to the US NBC defense readiness, and assesses whether a biological or chemical attack against the US should be considered asymmetric.

To answer the research question this study examines the published definitions of asymmetry and asymmetric warfare as they exist in contemporary literature and official documents. In addition, NBC defense readiness is analyzed to determine the level of readiness that creates asymmetry in relation to weapons of mass destruction. From this review and analysis a definition of asymmetric warfare is developed. The definition and its components serve as the evaluation criteria to judge whether WMD use against the US would be truly asymmetric. Case studies serve as the test environments or experiments (Operation Desert Storm and the 1996 Summer Olympic Games in Atlanta, Georgia). Each case study was selected based on its potential for WMD volatility. Although in both cases no US troops or civilians were exposed to WMD, planning considerations and force protection measures were serious concerns. The case studies are analyzed with regard to the developed definition in an attempt to determine if WMD attacks in either case study would be considered asymmetric.

Defining Asymmetric Warfare

Historical Perspective

As the United States prepares to enter the new millennium it possesses an unquestionable technological advantage over the rest globe. Advances in precision-guided weaponry, target acquisition and tracking devices, avionics, fire control systems, and secure communications combined with stealth technology place the US well ahead of its nearest peer competitor, technologically.⁷ However, is this enough to protect the nation's interests or win the next war? The US must assume that their strengths, as well as weaknesses, are well known to potential adversaries. Therefore, as stated by Clausewitz in his example of the wrestler and fencer, the US must believe that these adversaries are looking for ways to launch the "slight blow."

Military professionals have taken great interest in examining how this "slight blow" may be effected and have labeled this threat asymmetric warfare. The general argument follows that despite technological advantages of a superior nation, potential enemies with lesser technologies could embrace strategies or tactics to avoid these techno-strengths. However, despite the efforts of many in researching and discussing the topic, the definition of asymmetric warfare remains quite ambiguous.

In broad terms, the term asymmetric warfare appears to focus on warfare that seeks to avoid an opponent's strengths. It is designed to concentrate whatever may be one side's comparative advantages against the opponent's relative weakness. Recently, asymmetric warfare has emphasized unconventional or nontraditional methodologies.⁸ However, asymmetry or asymmetrical warfare as depicted in the above statement is not a new concept, philosophy or strategy.

As early as 2,500 years ago the idea of focusing on weakness with strength was discussed and practiced. In Sun Tzu's work, *Art of War*, he emphasized the importance of avoiding enemy strength and wrote,

“Go forth where they do not expect it, attack where they are not prepared.”⁹

Of particular note, Sun Tzu did not limit his focus of asymmetry on perceived weakness or strength in terms of military might or technology, his focus was purely on preparation or lack thereof.

History is replete with examples of war and conflict where one opponent maintains advantage or superiority over another in some form or fashion. By examining possible revolutions in military affairs one can gain an appreciation for this imbalance or asymmetry from a historical perspective. Although the focus of asymmetry has only been on technology, there appears to be a number of different ways that asymmetry can be created: cultural, technological, tactical, ideological, conceptual and organizational.¹⁰

In the fourteenth and fifteenth centuries cultural changes forced the transformation of feudalism to the establishment of nation-states where kingdoms recognized the need for their own armies. Technological advances such as the English longbow, the pike employed against infantry and the introduction of gunpowder placed the armored knight at a distinct disadvantage.¹¹

In the eighteenth century ideological, cultural and organizational changes prevailed. Political leaders in France in 1789 declared a *levee en masse*, placing citizens and goods at the disposal of the state. The result was that France tripled its army in less than a year and although it remained less effective in battle than their opponents on a unit for unit basis, France could accept casualties and fight on a scale like no other eighteenth

century opponent.¹²

Twentieth century examples are numerous but tend to migrate toward a mix of technology, tactical, organizational and conceptual. The list, although not inclusive, includes blitzkrieg or the armoured idea, carrier warfare, strategic air warfare, submarine warfare, weapons of mass destruction and conflicts of ideology. The Vietnamese communist movement, which combined revolutionary enthusiasm of the French Revolution in an intolerant culture, defeated two great Western powers.¹³

As the year 2000 rapidly approaches, the United States government has identified the need to prepare and plan to fight and win under the conditions described above. The National Military Strategy (NMS) 1998, states that an adversary may use asymmetric means against the US. Specifically, unconventional approaches to avoid or undermine US strengths while exploiting vulnerabilities. US dominance in the military arena may force adversaries to employ asymmetric means such as terrorism, information operations and weapons of mass destruction (WMD).¹⁴ While examples of asymmetry are numerous, an adequate definition, both conceptually and contextually, is illusive.

Contemporary Literature

Understanding the concept of asymmetry with respect to a military connotation must begin with the recognition that all modern and primitive states have both advantages and disadvantages in waging war with another state. With this in mind, asymmetry can be generally defined as any military significant difference between opposing parties with respect to the elements of military power.¹⁵ However, on the surface it would appear that the concept of asymmetry is much more intricate and complex than the aforementioned explanation.

From the enemy's perspective, asymmetry takes on a completely differently appearance when discussing center of gravity and operational art or the operational level of war. Possible characteristics of asymmetry as defined by the enemy may be when his operational strategy or maneuver is different from yours. Also, if he is seeking to attack a different center of gravity than the one you have selected as your own center of gravity.¹⁶

In addition to opposing and differing strategies or concepts of waging conflict, fundamental to most research on asymmetry and asymmetrical warfare is the idea of unequal power, economic and/or military. Asymmetric conflict can be defined as a conflict involving two states with unequal overall military and economic resources, not necessarily extremely strong and very weak but relatively unequal powers.¹⁷

The complex systems approach provides a unique perspective into the dynamic properties of asymmetry versus the linear or nonlinear approach. As a complex adaptive system, asymmetry is a dynamic as well as multidimensional phenomenon, consisting of a differential distribution of relevant resources and salient characteristics between adversaries in a conflict system. A possible example of one such system is the friction between Iraq and its dissident Kurdish community.¹⁸

From a macro-perspective, asymmetry appears to possess certain general characteristics. It appears to occur between diametrically opposing forces who maintain unequal power bases. They can exist in the form of military and economic power and exist as a complex adaptive system. Finally, the manner and strategic focus adversaries assume appears to maintain the potential to create asymmetry.

Asymmetry appears to be an emergent property of conflict that exists in many shapes and sizes. It can exist in one or all of five areas or variables of conflict: legal,

resources, tactical, moral/ethical and goals. Asymmetry from a legal perspective pertains to how a leader's ability is generally accepted within and outside his/her state, the degree to which an adversary's right to exist is accepted and recognized and the degree of legitimacy of the leader as accepted by the state and world. Resources play a major role in that they determine the amount of coercive potential of state may possess. Tactical asymmetry exists in the form of conventional or unconventional methods an adversary may choose to employ. Morality and ethics determine the manner in which the adversaries view their dispute as concerning issues of right and wrong and just form unjust. Lastly, the structural salience of goals will determine the level of internal cohesion and security of those in power to lead the cause.¹⁹

A slightly different perspective concerning how asymmetry exists suggests that it takes the shape of one of two orientations: technology or culturally. In the West and in the United States, asymmetrical warfare is expressed in technological terms. While technology plays a major role in asymmetry, the American mindset tends to see all asymmetric challenges as technical problems subject to engineered solutions. The fact that other nations may look at war from a fundamentally different viewpoint is foreign to many Western warriors. The West assumes that other nations think basically the same as Americans. Therefore, when this obtuseness towards cognitive orientations affects strategic thinking, asymmetries result.²⁰

Reducing the whole of asymmetry and asymmetric warfare to the some of its parts is useful when determining definitive qualities. However, a critical piece to the definition puzzle rests in application. Understanding how adversaries think about war helps potential opponents predict future strategies, or the application of war. First, a key

to understanding why parties act as they do seems to be the strategies they implement are primarily aimed at first equalizing an adversary's advantage or maintaining some favorable inequality. An example is the efforts of a weaker party to acquire coercive resources with which to offset those favorable to an opponent. However, the stronger party will make every effort to keep its adversary from acquiring resources to build up its own means of coercion.²¹ In general, adversaries will attempt to maintain or increase asymmetries that will increase their chances of winning the conflict or reverse unfavorable ones that will prevent the preferred outcome.²²

A strategy or manifestation of asymmetric warfare that is of great concern to Western political and military thinkers is terrorism. Although it is but one manifestation of asymmetric warfare, it is one that in all probability will increasingly challenge the West in the next century.²³

An adversary less constrained by political realities of capitalistic democracy may be able to gain an advantage by deploying the latest technology more rapidly and decisively than can the bureaucracy restrained Western nations. The type of warfare future adversaries may wage is not one that seeks to defeat US or Western military forces, but rather assaults the psyche and will of the populations whose political support is required by Western democracies to sustain military operations.²⁴

Conflicts involving less-than-vital Western or US interests pose a particular challenge. Americans have had the luxury of rarely having to fight for truly vital interests; that is, those in which the future shape or governance of the nation is at stake. In contrast, our adversaries frequently fight for such high stakes. This asymmetry means that we will very often find that our adversaries are prepared to withstand a great deal of

punishment in wartime, a fact that will test our resolve and staying power.²⁵

The most serious future challenges are those that exploit US sensitivities to casualties and the need to deploy troops and supplies rapidly and across great distances. One key challenge is posed by WMD. Any determined mid-sized state has the wherewithal to create lethal chemical or biological weapons. In the hands of an adversary, these weapons have the potential to call into question the viability of US military strategy and operations. Replay the Gulf War, imagining that Saddam Hussein had employed such weapons. Populating the battlefield with more Americans is, in many circumstances, exactly the opposite of what is called for. Given the asymmetries in stakes mentioned above, threatened US retaliation may not be sufficient to deter their use.²⁶

A review of literature, both historical and contemporary, narrows the focus of the quest for a definitive, contextual definition of asymmetry and asymmetric warfare. Although the review was not all-inclusive it provides parameters to bound a relatively acceptable solution. However, the review would not be complete without including doctrinal views from both the joint and Army perspectives.

From the joint perspective, asymmetry involves future adversaries having an independent will, with knowledge of friendly capabilities and the desire to avoid strengths and exploit vulnerabilities.²⁷ Asymmetric warfare involves dissimilar forces which can be extremely lethal, especially if the force being attacked is unprepared against the threat.²⁸ Examples of asymmetric warfare from the macro-level include air versus sea and sea versus land.²⁹ The Army view of asymmetry and asymmetric warfare tends to be more specific. As defined in FM 100-5, *Operations*, asymmetry or asymmetric warfare is

“a characteristic of operations between forces conducting actions to force an opponent to shield against things for which he has no immediate understanding, design, or capability, placing him at a severe disadvantage.”³⁰ As noted above attempting to universally define asymmetric warfare within the military community appears to be infinitely difficult.

Developing a Definition of Asymmetric Warfare

A review of historical, contemporary and military doctrine reveals some commonalities that span across all three areas. It appears that two fundamental issues provide the bedrock for the presence of asymmetry, preparedness and power. Preparedness embodies the idea that a force can either shield itself against a threat capability or maintains an organizational, strategic or tactical capability to which in and of itself provides a distinct advantage over an opponent. Power refers to a resource or technology, that if possessed or developed, provides a force a coercive advantage over an opponent who lacks the ability to counter the advantage. A third component of asymmetry exists that spans both preparedness and power, the concept of ideology. Ideology embodies the idea that a nation thinks differently than its adversary and the rest of the world. It may possess the cultural wherewithal to either withstand excruciating punishment or the moral/ethical beliefs to violate global bounds of accepted behavior.

Asymmetry then can be defined as inequality between two opposing entities where one exhibits distinct advantage over the other. With respect to military forces, asymmetric warfare can be defined as conflict involving two opponents where one maintains the capability to strike the other, unprepared or lacking sufficient power to defend itself against that specific capability. History is replete with examples that span the asymmetric warfare spectrum of conflict (Figure 1).

Asymmetric Spectrum of Conflict

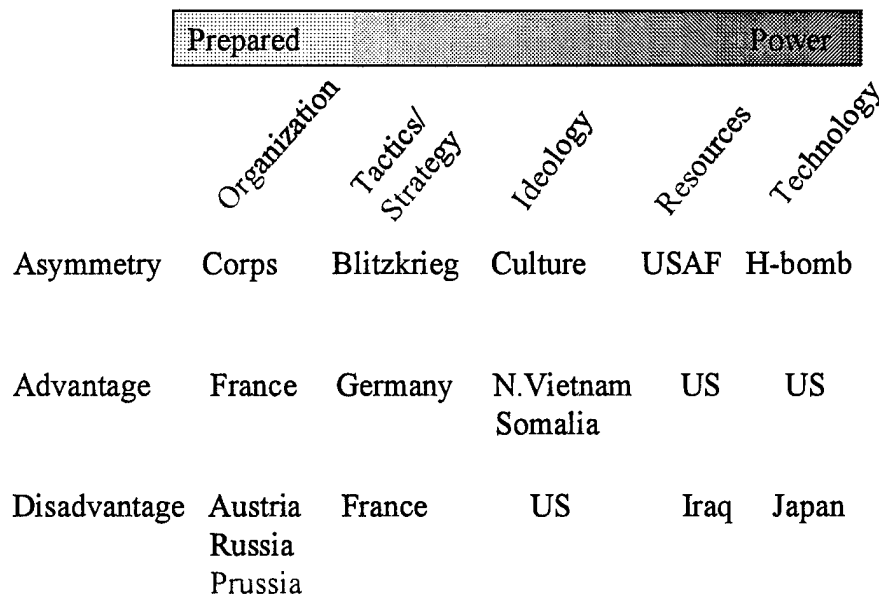


Figure 1. Asymmetric Spectrum of Conflict

As history depicts, those at the receiving end of asymmetric warfare have paid dearly in defeat. While wars may not be won purely using asymmetric strategies or tactics, battles are well within grasp. One such capability that has received much discussion as of late is the use of nuclear, biological or chemical weapons (NBC) or weapons of mass destruction (WMD). Because of their relative ease to obtain, WMD appear to be the likely tools of any state that opts for an “asymmetric strategy” against a superior military might such as the United States, in an effort to deter its more powerful opponent with the threat of limited WMD attacks. This gives the weaker opponent the capability to strike at the stronger opponent’s vulnerabilities and avoid having to fight or face the adversary’s strengths.³¹

Some authors argue that based on the West’s technological orientation, sizable nuclear arsenals and relatively robust capability to deal with biological and chemical

weapons, WMD used against the United States would be an attempt to match the West symmetrically.³² In a sense, using WMD against the US would represent an ill-fated attempt to strike America's military strength. However, to make such an assertion one must assume that America is prepared to defend against WMD, both abroad and at home.

Defending against such a threat is an extremely complex and resource intensive challenge. With the extent of global proliferation of WMD one should not be so quick to assume that any nation or its people are prepared to defend against a chemical or biological agent attack. Future campaigns may be fought on a symmetric battlefield because of the proliferation of WMD. Also, the constraint of US retaliatory capability may increase the possibility of an enemy NBC attack. Therefore, NBC readiness to fight in a campaign containing an NBC environment must not only be maintained to ensure force survival, but to serve as a major deterrent to any adversary perceiving advantage by employing WMD.³³ However, some experts believe that international adversaries will carry out covert NBC attacks regardless of perceived preparedness. There are several reasons why a state might use WMD and pertain to asymmetrical power relations presently existing between certain states and their opponents.³⁴

One weapon that maintains membership in the WMD triad is biological weapons. Although hotly talked about, little is really known about such weapons from a strategic defense standpoint. While we know how to treat victims plagued with wretched diseases such as anthrax and botulinin, little is really known about how to accurately detect and identify these weapons/diseases across the spectrum of employment, from the battlefield to the subway. Their delivery at the proper time and place would almost certainly cause massive casualties on the battlefield or industrialized nation, with estimates ranging from

100,000 to a million dependent on the population density.³⁵ Employment of biological weapons truly exemplifies asymmetric warfare in its most basic sense and stands as weapon of mass destruction.

Biological weapons, in and of themselves, present a formidable threat. Biological weapons in the hands of a rogue state, or worse, terrorists, represents a threat of apocalyptic proportions. The US government, for example, is responsible for the protection and safety of its service members and citizens. Comprehensive measures have been taken to provide for this protection. However, terrorism capitalizes on the paradox that terrorists can attack anywhere at anytime, while government security forces are powerless and unprepared to protect every conceivable target all the time.³⁶ Successful terrorist use of WMD against US citizens abroad or at home could cause catastrophic destruction and loss of faith in the government infrastructure. The horror of terrorist use of WMD against civilians provides great leverage against powerful nations and their national interests. Attacking the US or Western states with WMD either by terrorists or conventional military forces could sever coalitions, degrade political consensus, influence US forces and fracture national will.³⁷ NBC defense preparedness is critical in maintaining a viable counter to the asymmetric nature inherent to WMD. However, what constitutes a viable defense? A review of the United States NBC defensive strategy provides the basis for such a defense.

NBC Defense

To adequately answer the question presented above one must present the data in two separate, but related parts. First, one must address a defensive strategy from purely a

military perspective and then address the question from a homeland defense perspective. Although intimately linked, each strategy possesses distinct elements.

According to the National Military Strategy, May 1998, the US military is required to “effectively conduct sustained operations despite the presence, threat or use of WMD. Such preparedness requires the capability to deter, detect, protect against and respond to the use of WMD when necessary.”³⁸ Joint doctrine states that US forces must be prepared to conduct operations in an NBC environment with minimal degradation. This requires an NBC defense which protects forces and maintains the means to remove or cope with operationally significant hazards.³⁹ The bottom line remains that “ether-level” political and military leaders have directed that US forces must be prepared and equipped to fight, survive and win on a NBC contaminated battlefield. In other words, the NCA set the standard of performance for US forces. The agency required to ensure that the standard is achieved and maintained is the US Army Chemical Corps.

To provide direction for achievement of the standard across the military Chemical Corps leadership has provided a vision and focus to ensure success is achieved:

Focus – The ability to protect the force throughout the depth of the battlespace and across the full spectrum of operating environments.

Vision – enable the commander to minimize casualties and preserve combat power in an NBC environment. Defend against an NBC attack with minimal casualties and degradation, allowing commanders to quickly restore combat power and continue their mission across the full spectrum of operating environments.⁴⁰

To operationalize this vision and meet the standards set by the NCA the Chemical Corps designed a defense strategy that is grounded in three principles:

Avoid – avoid NBC effects through active and passive defensive measure

Protect – protect forces and equipment

Restore – decontaminate to allow reduction in protective posture

US forces will survive and win under NBC conditions by using these doctrinal principles.

By being better prepared than the enemy for continuous operations under NBC conditions, the US forces will maintain an advantage, countering the desired asymmetric strategy of future adversaries. The advantage will either deter the aggressor or, if chooses to use WMD, will force him to cease use or continue the conflict at a disadvantage.⁴¹

NBC defense, while resource and manpower intensive, has well defined parameters and quantifiable standards from the military perspective. Considering NBC defense from a domestic or homeland focus is much more complex and extremely difficult to measure. Under Title XIV, US Code, Congress directed a program to enhance the capability of the federal government to prevent and respond to terrorist incidents involving WMD. This program was designed to provide enhanced support to improve the capabilities of state and local emergency response agencies to prevent and respond to such incidents at both the national and local level.

To achieve this end Presidential Decision Directive 62, signed May 1998, established an overarching policy and assigned responsibilities for responding to terrorist acts involving WMD. The directive states that the federal government will respond rapidly and decisively to any terrorist incident in the US, working with state and local governments to restore order and deliver emergency assistance. The Department of Justice, acting through the FBI, has the overall lead in operational response to a WMD incident. To operationalize this initiative, the Domestic Terrorism Program was

established to build the capability in 120 major cities for first responders to be able to deal with WMD incidents by the year 2002.⁴²

While providing a general framework in establishing a defensive strategy several areas of this program are inadequate to meet its goal. There appears to be a lack of consolidated effort and direction at all levels of the program. The existing interagency process in fighting terrorism within the US is split among various department responsible for handling terrorist acts inside and outside the US. DOD's counterterrorism role is primarily designed for dealing with terrorists outside the United States. Lastly, there appears to be a clear lack of a designated body to address WMD terrorism.

In summary, it must be understood that Western, and specifically the United States, governments' ability to quickly respond and effectively handle both military and domestic incidents with regard to WMD frames the value of a nation's readiness.⁴³ The failure to identify, detect and manage this situation cost countless lives and second and third order consequences yet to be identified. Even the perception that a nation lacks the ability to respond has severe ramifications. Therefore, it is vitally important to a nation and its people to identify what provides the attacker a viable asymmetric advantage with respect to WMD and ensure appropriate measures are taken to mitigate this threat.

WMD Asymmetry-A Matter of Preparedness

The 1998 NMS recognizes that enemies may strike using asymmetric means, WMD, unconventional warfare, or an adaptation of Western techniques and weapons against the West. We may even expect them to employ all these forms of asymmetric warfare against the West simultaneously. Asymmetric forms of warfare will clearly be employed against one specific center of gravity, cohesion of domestic and foreign

coalitions. These forms of warfare avert a head-on collision with high-tech precision weapons, aiming to create favorable asymmetry for states who are willing to use unconventional or WMD forms of war. To counter this threat the US strives for “preparedness asymmetry” created by a viable and substantial NBC defense system. The goal of “preparedness asymmetry” is to maintain organizational, strategic and tactical capabilities designed to shield against or deter enemy use of WMD. Therefore, the stage is set.⁴⁴

The NMS and Western national governments agree that an enemy exists that possess the coercive power to obtain and employ WMD and the ideology to justify its use. Yet, despite continuing debate over what threats the West may actually face, it is not clear that an appreciation for states who are willing to use WMD exists.⁴⁵

The irony of this situation reveals that while we debate the legitimacy of possible WMD use globally, nation-states are aggressively pursuing NBC capabilities as economic and force equalizers for asymmetric advantage. A WMD confident and capable adversary sees anything as possible. While their use is not acceptable to the global community, they may see it as an equalizer and consider it a conventional, tactical weapon.⁴⁶

Implied in the US strategy is that we possess the tactical and organizational constructs to defend against such threats. Also, it is implied that the US will respond to WMD attacks with nuclear weapons. However, if an adequate defense is lacking and the US lacks the ideological justification to respond coercively, is the US and Western nations prepared for this threat? Therefore the reality or even the perception of potential adversaries that Western nations are not prepared to handle WMD attacks and lack the

coercive power to respond with force effectively provide the attackers asymmetric advantage.

Examining US preparedness to handle such attacks is worthwhile. While the military possesses the organizational and technical means to protect itself from WMD, the skill or competency of the individual soldier to execute individual and collective tasks with respect to NBC defense may be questionable. A topic that will be discussed in a later chapter. However, a unique dynamic exists today that extends beyond the soldier on the battlefield and one that may prove the biggest challenge.

Due to the two MRC response requirements, what would be the implications of a response when military forces are engaged abroad and an asymmetric attack occurs at home? An attack against one or several major urban areas could force the US to come to an abrupt halt due to overloaded communications networks, general mass confusion and disorder of the population, as well as economical production degradation. The potential exists for such attacks to cause massive casualties quickly and overload national and local communications networks and degrade coordination among emergency response teams, generating chaos. The effects would not only be devastating at home, but also to any concurrent regional conflict which would most likely be the cause of an asymmetric attack.⁴⁷

Whether at home or abroad, WMD employed against one or more national interests would pose a significant challenge to any state. The degree of preparedness a nation maintains to meet this asymmetric threat appears to be the mitigating factor. Plenty of anti-Western states and groups exist that possess the ideology and ability to acquire and employ WMD. As indicted earlier, these states lack the coercive power to

influence the United States or other Western nations conventionally, therein lies the motivation to acquire an asymmetric advantage, militarily. Efforts are underway to interdict employment of WMD in any form. However, the key to denying WMD asymmetric warfare advantage rests in a nation's ability to protect itself and cope with the effects if required. Failure to do so risks the lives of military service members abroad and civilians at home.

The Contemporary Importance of Studying Weapons of Mass Destruction

Although weapons of mass destruction have received a lot of attention in recent years, their use is not exclusive to the twentieth century. Their employment has been documented prior to the birth of Christ and has plagued history since. The sheer destructive power and ease to obtain WMD validate an analysis of the topic for any developed state. A review of the history of weapons of mass destruction can reveal much about their employment, effectiveness and coercive threat potential as they affected all involved parties. An analysis of this data and potential threat proliferators can help us better prepare for what many believe an imminent and inevitable attack.

History of Chemical Warfare

The first use of chemical weapons in conflict dates back to 2000 B.C. when toxic fumes were employed in India. Thucydides documented the use of chemical warfare in the form of burning pitch and sulfur during the Peloponnesian War during the sieges of Plataea in 429 B.C. and Delium in 424 B.C.⁴⁸ The Emperor Constantine Pogonatus employed a derivative of napalm when he besieged Constantinople in 673 as did the Moslems at Acre 500 years later. Finally, almost 150 years prior to the start of World War I the Germans used asphyxiating gas against the Austrians at the Selesian fortress of

Schweidnitz.⁴⁹

Prior to World War I other interesting developments in the realm of chemical warfare emerged. Smoke obscuration was successfully used by Charles XII of Sweden during a river crossing in 1701. By the 1860's American interest in chemical warfare was being explored. John W. Doughty unsuccessfully attempted to persuade Secretary of War Stanton to employ chlorine gas in the Civil War.⁵⁰

The employment of chemical weapons ceased until the beginning of World War I when the Germans were the first to turn to science looking for a method to break the stalemate in France. Chemists early in the war suggested to the German high command of the possibilities of chemical warfare but the German generals were hesitant to use it until the stalemate continued into 1915.⁵¹

Although there were better sites to conduct a chemical attack the German high command selected the Ypres salient as the location for the experimental attack. On April 22, 1915, at approximately 1730 hours, following heavy shelling in the northern salient, a mysterious cloud began slowly moving across the French trenches.⁵² The effects of the use of chemical weapons at Ypres were devastating. Individually, the gas burned the respiratory system and skin of the helpless soldier and sent hundreds into a panic-stricken run to the rear of the defense and away from the advancing yellowish-green cloud. German soldiers later reported that the effects of the attack were horrific. They found dead lying on their backs with clenched fists in the middle of the yellow stained fields in the area of the attack.⁵³ Tactically, the one-hour gas attack at Ypres created a gap in the French salient four and a half miles wide almost instantaneously.

Response to the first effective use of chemical weapons in World War I was swift.

Immediately following the gas attack at Ypres, the Allies frantically attempted to shorten the technological and tactical distance between the Germans and themselves in the chemical weapons arena. All combatants developed chemical warfare services and units whose mission it was to develop and manufacture chemical weapons and equipment. It was estimated that over 3,000 substances were tested for possible use as an offensive weapon.⁵⁴ Within five months of the attack at Ypres the British were the first to retaliate by launching a gas attack at Loos.⁵⁵ The German use of gas stimulated the Allied governments to draw more heavily on their scientists for support. New gases to attack the Germans were developed as well as flame weapons, smoke/obscuration devices and protective equipment.⁵⁶ A new form of war was underway as the belligerents attempted to reduce the increased “fog and friction” it created. However, a new player was about to enter the war in 1917 who failed to respect the devastating effects of chemical warfare.

General Pershing’s well known quote on the devastating effects of chemical weapons best captured the American military experience with chemical warfare. Despite the extensive use of gas warfare from 1915 to 1917, US preparation started in earnest after entering the war. The American Expeditionary Force’s failure to understand and gain an appreciation for a chemically developed theater of war caused countless and unnecessary casualties.

The first successful use of poison gas in World War I by the Germans was obviously horrific. The casualty toll of the Second Ypres was heavy with the British alone losing over 57,000 men killed, wounded and missing. However, the Second Ypres marked the first time that men in battle witnessed the physical effects of poison gas warfare. The frightful effects of “gassing” included blindness, burned internal organs

and, in some, death.⁵⁷ Although the use of gas was labeled as barbaric, inhumane, and feared by soldiers more than any other weapon on the battlefield, it was less lethal than all the other weapons combined.⁵⁸ Of the estimated 1.2 million gas casualties in the war death only accounted for 7%.⁵⁹ However, the effects of chemical weapons in the war were significant for two reasons. First, a single gas attack could literally cripple medical support systems by its production of large numbers of casualties at one time. Second, no other weapons in the war had a greater psychological impact on the individual soldier and country than did the use of chemical weapons. The use of gas had other significant effects as well. Germany's first use of chemical weapons were viewed as "inhumane acts" and further reinforced the resolve of the British soldiers and people to continue the war to its bitter end.⁶⁰

Proliferation of chemical weapons in World War I altered the face of battle. Their use at the tactical level of war served to increase attrition, decrease morale and reduced combat power. While armies quickly attempted to adapt and minimize its effectiveness, chemical warfare used against unprotected or unprepared troops created large numbers of casualties.⁶¹

Chemical weapons on the battlefield in World War I influenced the evolution of warfare in both the near and long term, as well. In the near term it established a permanent role for scientists as force multipliers in developing new and improved ways to introduce chemical weapons and provide for the protection of the individual soldier. It also served as the start point for the world to view chemical weapons as barbarous and something that only less civilized countries would ever considering using. In the long term the use of gas launched the evolution of a new condition on the battlefield that all

commanders must always consider. Whether in the offense or defense the use of chemical weapons was a factor that could play a major role in winning a battle and crippling an army.

Finally, the use of chemical weapons proved that if properly motivated, nations possessed the ideology to employ weapons of mass destruction. In both the near and long term nations engaging in conflict would be forced to consider the existence of weapons of mass destruction as a possible or even probable condition on the battlefield.

After World War I and before World War II chemical weapons were used by both the Italians and Japanese against combatants and civilians. However, their employment never approached the enormity of World War I.

The Italians employed chemical weapons aggressively in Ethiopia in 1935 to 1936. Mustard gas bombs and aerial spraying created an estimated 15,000 casualties to include an unknown number of intentionally targeted civilians.

In conflict with China, the Japanese Army employed mustard gas, lewisite, phosgene and other chemical agents from 1937 to 1945. Similar to the Italians, the Japanese targeted unprotected military forces and civilians. Over 900 attacks were reported.⁶²

The inter-war years witnessed the arrival of a methodology for employing chemical warfare, the targeting of civilian populations. In the years to follow history would repeat itself.

By the end of WWI the rise and sophistication of chemical warfare gave birth to another, more horrific form of killing. During the inter-war years the possibility of weaponizing biological agents became a realization. Germany, Britain, France, Japan

and the Soviet Union all conducted biological research. Japan, first and foremost, showed the greatest interest. Allegedly, Japan used biological weapons against the Soviet Union and Mongolia. Allegations include use against Chinese civilians and soldiers and experiments on prisoners of war. Belligerents in World War II fought on a chemical free battlefield. Although one would like to believe that legal and moral issues removed this horrific weapon from the war the fear of retaliation most likely forced its absence. Germany and Britain believed that the introduction of chemical warfare would cause retaliation, specifically against civilian populations.⁶³

Tactically, World War I showed that employment of gas on the battlefield was more advantageous to the defender than the attacker. Denial of terrain by employing a lingering gas in the already crowded battleground was not a wise option.

In the Pacific Theater the United States contemplated using gas several times. However, President Roosevelt's moral conviction, coupled with the fear of retaliation in the European theater, prevented its use in the Pacific.⁶⁴ Although void of chemical weapons, the Pacific theater became the birth ground for the most devastating weapon of mass destruction known to man, the atomic bomb.

After World War II and prior to the United States involvement in Vietnam the use of chemical weapons persisted. Egypt employed mustard and phosgene aerial bombs in the Yemeni civil war, 1963 to 1967, killing close to 1,400 people. In the same time frame Libya allegedly used chemical weapons against Chad.⁶⁵

In Vietnam the United States employed herbicides and riot control agents, however, cautious to avoid categorizing them as chemical warfare agents claiming RCAs were not categorized under the Geneva Protocol. The American use of chemical agents

in Vietnam significantly impacted both US perceptions and others' perception of the United States attitude toward chemical warfare.⁶⁶

The Iran-Iraq War marked the most prolific use of chemical weapons since 1918. Both belligerents used chemical weapons extensively against one another; however, Iraqi employment proved most effective.

Iraqi interest in chemical warfare dates back to 1965. In the mid-1970's reports surfaced about Iraq actively acquiring chemical weapons. In November 1983 Iranian officials alleged that Iraq used chemical weapons delivered aurally, and with indirect fire. Most likely Iraq, coming under severe pressure from Iranian offensives, resorted to both testing and employing chemical weapons to signal to Iran that they had the capability and were willing to use it.

By March of 1984 US government officials and the International Red Cross confirmed the use of chemical weapons and issued warnings to the Iraqis. Experts found evidence of mustard gas and Tabun nerve agent. By 1985 Iranian soldiers were issued gas masks and full protective clothing.

Iran launched a major offensive March 11, 1985, and appeared close to achieving a breakthrough. However, Iraq fearing defeat employed chemical weapons and successfully halted the Iranian offensive. Iraqi conventional chemical attacks continued through the summer of 1987.⁶⁷

Most horrifying, Iraq did not limit its use of WMD to combatants. On March 17, 1988, Iraq launched a variety of chemical weapons against the Kurdish village of Halabja killing hundreds of Kurdish refugees. Explicit and detailed media coverage of the attack promoted worldwide demand for the elimination of chemical weapons.⁶⁸

Iraq's use of chemical weapons in the Iran-Iraq War confirmed that it had developed and possessed a substantial chemical weapon arsenal and maintained the ideology to use it. Iraq's invasion of Kuwait in 1990 and the US response requirement increased the probability of US soldiers fighting in a chemical environment.⁶⁹

Although Iraq possessed the capability and experience to use CW, Operation Desert Storm was executed in a chemically free environment. Saddam Hussein's reasoning not to employ chemical weapons during the Persian Gulf War is unknown. US and Coalition actions probably played a key role and had a considerable effect.⁷⁰

The history of warfare contains many examples of nations' enthusiasm to use weapons of mass destruction. Consistent in all situations where chemical weapons were employed, the antagonist possessed the ideology and power to successfully gain asymmetric advantage from such an attack. The use of chemical, biological and nuclear weapons will forever remain a serious concern. Political and military leaders must always consider whether WMD will be used, by whom and how? The answer will determine the nation's ability to protect its fighting men and women and protect its national interests.

The Threat

In an interview U.S. Defense Secretary William Cohen stated that the US has "such overwhelming power that other countries now will, in fact, turn to the asymmetrical types of threats."⁷¹ Specifically, nations or special interest groups (non-state/sub-national groups) threatening US interests would attempt to cripple American military forces and infrastructure with unconventional means.

Given the fact that the US must face this possible type of threat is the simple

portion of the analysis. Weapons of mass destruction are somewhat easy to acquire. Possession of WMD provides lesser-developed nations non-state/sub-national groups blackmailing power.⁷²

The widespread proliferation of WMD begs the question of how a belligerent might employ WMD. The May 1997 Quadrennial Defense Review outlined that defense planners must assume WMD use as a probable condition in future operations and to be used to disrupt US deployment operations and logistics. To adequately meet this challenge US forces must be properly trained and equipped to operate effectively in this likely environment.⁷³

Believing a threat exists in the form of WMD provides the catalyst for preparedness. Iraq, Iran, Libya, Syria and North Korea are biological and/or chemical threat proliferators. The threat posed by these nations contrasts significantly to those of the former Soviet Union.⁷⁴

North Korea maintains substantial NBC weapons and ballistic missile capability. They have not signed any weapons treaty bans and deal freely in the weapons trading market.⁷⁵ Iran, although signing all existing weapons treaty bans, is self sufficient at producing chemical and biological agents and could become a supplier. Iran supplied Libya with chemical agents in 1987.⁷⁶

Past and most recent actions indicate Iraq's clear intent with regard to WMD. They maintained a wide variety of chemical warfare agents prior to the Gulf War and recent intelligence indicates that they maintain the capability to produce and deliver WMD.⁷⁷ Due to the capability and penchant for WMD, Saddam Hussein has skillfully forced the US to deploy significant military forces into the Persian Gulf. While precision

munitions are targeted for command and control nodes within Iraq, the elimination of Iraq's WMD capability through such methods is not possible.⁷⁸

States possessing lesser capabilities include Libya, Chad and Syria. Libya's Mohamar Qadhafi supports development of NBC weapons and missile capabilities. Libya produced blister and nerve agents in 1980 and employed chemical agents against Chad troops in 1987 which justifies serious concern.⁷⁹ Lastly, Syria although not likely to use WMD against an enemy unless its survival is at stake, produces chemical agents and has the biotech infrastructure to support a bio-warfare program.⁸⁰

Although not considered a threat in the traditional sense, Russia is a serious concern. Economic and political challenges and the large number of weapons, to include weapons grade nuclear material, still in their post-Soviet Union inventory pose a significant concern worldwide. Despite official statements their role as a supplier remains credible. Attempts to demilitarize existing weapons stores is lengthy and costly. In addition, the threat of proliferation of WMD systems and technologies from the former Soviet states is a concern.⁸¹

A second, or covert, WMD threat exists in the form of non-state actors and terrorist organizations; a threat that is relatively exclusive to the late twentieth century. Evidence suggests that the threat of WMD terrorism is growing because on increasing number of non-state actors are WMD capable and interested in causing mass casualties. It is possible that these organizations will refrain from WMD employment and continue with past techniques to gain publicity for their terrorist acts. However, the use of Sarin gas by the Aum Shinrikyo in Japan forced expert and official opinion to morph and is recognized as one of the most serious security challenges of the twenty-first century.⁸²

According to a 1995 FBI report on terrorism large-scale attacks inflicting mass casualties, such as the Oklahoma City bombing, appear to be on the rise. The employment of WMD can only increase the number of casualties. New groups are emerging that have interests in violence for its own sake, often-founded in religious fundamentalism or political radicalism.⁸³ While research has explored and uncovered several reasons why a non-state actor might employ WMD two specific reasons rise to the top. First, as discussed earlier, the desire to create very high casualties is one motive. While teetering on the edge of insanity, this reason is nevertheless possible. Second, the use of WMD or threat of use would create, and possibly manipulate, terror of infinite proportions.⁸⁴

As late as February 24, 1999, at least 20 possible anthrax incidents were reported in the United States in 1999 alone. Although all turned out to be hoaxes, the performance of federal and local responders left the public believing much to be desired in the way of national response. The idea that the public has gained awareness of a bio-threat is enlightening. The idea that hoaxes are prevalent is alarming. However, if anyone called in a biothreat and said it was botulinum toxin or cholera we would have a problem that we may not be able to handle, hoax or not.

Recent incidents involving the use of chemical weapons exemplified their terror and intimidation qualities. Regardless of who uses them, the potential for WMD use is growing.⁸⁵

Failure to counter and recognize asymmetric threats that exist for the military and at home will place the United States at a distinct disadvantage in the twenty-first century. As evidence earlier, the threat is severely complicated by the number of potential

adversaries who possess the means to employ WMD and the ideology to use it.⁸⁶ The threat is both widespread and complex. As the Secretary of Defense stated, “American military superiority actually increases the threat of WMD against us by creating incentives to challenge us asymmetrically.” While US and Western officials have recognized that threat is real, collective preparedness is debatable. Has the US provided the potential attacker asymmetric advantage? If recent history provides any indicators, the answer is “yes.”

Case Studies

A study of past operations proves beneficial to obtain a realistic view of US military and domestic preparedness against a WMD attack. Operation Desert Shield/Storm and events that supported the 1996 Summer Olympic Games in Atlanta were selected based on their potential for WMD volatility. Each case study was examined to determine the WMD threat and US preparedness requirements. Then, an analysis of these findings was conducted to determine if the hypothetical attacks against the US targets in these scenarios would be considered asymmetric by definition.

In general, the research indicated that WMD could be employed in either covert or overt manners and against military and civilian targets. For the purposes of this research a two step modified intelligence preparation of the battlefield (IPB) serves as the model for study to analyze threat capabilities in both case studies. Only portions of the IPB that pertain to WMD will be examined. The study model is comprised of two parts:

- 1) Evaluation of the threat
- 2) Determination of threat courses of action

With respect to preparedness the standard of performance for the US military was

a force prepared and equipped to fight, survive and win on a NBC contaminated battlefield. Although a subjective standard, it serves as the baseline for US NBC defense. The domestic program established by Presidential Decision Directive 62 (PDD62) is much more ambiguous and subjective, but nevertheless identifies the domestic standard for NBC defense preparedness. The standard set forth in PDD62 states that the federal government will respond rapidly and decisively to any terrorist incident in the US, working with state and local governments to restore order and deliver emergency assistance.

Operation Desert Shield/Storm

The fact that Iraq did not use its biological and chemical weapons against the Coalition should not detract attention from the growing threat to America's military strategy and forces.⁸⁷ Furthermore, although it is not clear why Iraq did not use its WMD arsenal, substantial difficulties to both the build up and combat stages of the war would have occurred if it had. It is important for this study to gain an appreciation for Iraq's coercive potential for employing WMD during the Gulf War.

Iraq started the Gulf War with substantial chemical and biological weapons stockpiles. Saddam Huessein's volatile rhetoric implied he was willing to use these weapons on the battlefield to inflict mass casualties. Iraq had demonstrated a willingness to inflict casualties with WMD against enemy troops in the Iran-Iraq War and against his own Kurdish population at the close of the war. Iraqi Scud attacks against civilian populations in Saudi Arabia, Israel and other Gulf states portray the viability of the Iraqi menace.⁸⁸

Iraq had a variety of chemical warfare agent stockpiles available before the Gulf

War including blister (mustard) and nerve (Tabun and Sarin) agents. By 1990, Iraq had the largest chemical warfare production capability in the Third World, producing thousands of tons of agents, annually.⁸⁹ Most alarming was the information released as a result of Hussein Kamel's defection. Kamel revealed that Iraq maintained a program to develop nerve agent VX and possessed the material to produce it prior to 1991. Equally important, Iraq possessed the delivery means to effectively employ these agents against Coalition forces.⁹⁰ Although chemical weapons posed a menacing challenge to Coalition forces, something else lurked in Iraqi arsenals which was far more deadly.

When Iraq invaded Kuwait, US intelligence officials had no idea of the extent of Iraq's biological weapons program. The speed Iraq was able to start a biological weapons program, which included weaponizing anthrax and botulinum toxin, was quite remarkable. Many military and technical experts agree that Iraq's intention for employment of biological weapons, by bomb or warhead, were for strategic purposes. According to Iraqi accounts after the war, it produced 158 gallons of concentrated anthrax prior to February 1991, enough to weaponize forty to fifty bombs or warheads. Estimates reveal that, if properly employed, each weapon could kill thousands of people.⁹¹

Determining the most likely threat scenario is difficult given the wide array of WMD at Iraq's disposal prior to the Gulf War. However, precedence directs attention to the Iraqi use of chemical weapons against Iran from 1984 to 1988. Prior to 1985, Iraq used chemical weapons against Iran to deny Iranian offensive success. Iraq integrated mustard gas with engineer obstacles and conventional indirect fire to delay the human wave tactics of the Iranians. Iraq was also suspected of mixing biological agents with

their chemical attacks.⁹² During 1987 and 1988 Iraq extended its employment of chemical weapons to the Kurdish civilian population. The purpose of such attacks may have been an attempt to weaken the morale of Iranian civilian support for the war.⁹³

Regardless of their intent, Iraq displayed they possessed the doctrine and training to employ integrated chemical weapons and conventional fires on the battlefield.⁹⁴ Based on the evidence drawn from their war with Iran, it appears that Iraq was likely to employ WMD under three scenarios: tactical, operational and strategic.

The first scenario involves the tactical employment of chemical weapons through the use of integrated fires in the defense. In this scenario Iraq would employ chemical weapons against massed combat troops conducting offensive operations. A likely target during the Gulf War would have been the VII Corps operational maneuver into southwest Iraq.

The flow of logistics and build-up of forces was a concern very early in the war. In conjunction with this concern on the part of military planners was the belief that Iraq possessed a formidable stockpile of VX nerve agent.⁹⁵ A persistent agent attack using VX nerve agent could have contaminated points of debarkation such as ports or airfields and stymied traffic indefinitely.

The third scenario, more strategic in nature, involves the use of chemical or biological weapons to erode the strength of Coalition and public support through mass casualties. Employment of biological weapons would pose the most menacing threat to Coalition forces and civilian populations.

Upon review of the three scenarios and Iraq's method for employing chemical weapons against Iran, it appears that the tactical use of chemical weapons against

Coalition forces would be most likely. While the other scenarios were viable, the first scenario is supported by historical data.

Whether chemical or biological, weapons of mass destruction employed during the Gulf War would have presented an enormous effect on the execution of the war. The strain on medical support systems and logistical functions may have ground the Coalition effort to a crawl. The mechanism to ensure this did not happen was the spectrum of Coalition NBC defense measures. However, did the Coalition and specifically the US, possess asymmetric preparedness to deter or manage the consequences of an Iraqi WMD attack? Failure may have resulted in an asymmetric advantage on the part of Iraq. Given the possibility of a WMD attack in the region, what are the requirements concerning NBC defense to achieve real or perceived asymmetric preparedness?

The most likely threat scenario consisted of employment of WMD (chemical agents) through the use of integrated fires in the defense against massed combat troops conducting offensive operations. Therefore, what specific requirements must be met from an NBC defense perspective to achieve desired preparedness in the wake of a chemical attack?

To negate the effects of WMD would require support across the entire spectrum of NBC defense. Diligent planning and preparation with regard to NBC defense (avoid, protect and restore) would dramatically enhance protection of the force and achievement of the mission.

As implied in the doctrine, avoidance measures, both active and passive, can deny the enemy the opportunity to employ NBC weapons effectively. Therefore, contamination detection and identification is critical to mission success. Once the

contamination has been detected and identified, this information must be communicated to the command to prevent additional casualties.

Although complete avoidance of a chemical hazard is most desired, a unit may be required to enter a contaminated area or provide support to those subjected to a chemical attack. Provided employment of WMD in theater against Coalition forces, NBC protection would be paramount to the survivability of the force and success of the mission. Active protection measures would be required in this scenario. First, the US forces must maintain the ability to conduct operations in any environment without loss of life or operations tempo. Second, an overt display of NBC defense capabilities may preclude additional attacks. Third, the capability to support Coalition forces with NBC defense would bolster confidence in the operation and raise mission success probability.

Operating in or near a chemical hazard requires significant restoration support from NBC defense assets. Immediate and thorough restoration of military and civilian casualties increases the commander's ability to achieve the mission. Conducting a mission similar to Operation Desert Shield/Storm in the wake of a chemical attack presents some significant challenges to Coalition forces and NBC defense assets. To achieve real or perceived asymmetric preparedness, a broad range of capabilities specific to NBC defense are critical. The degree to which these capabilities provided asymmetric preparedness will be addressed in the case study analysis.

1996 Summer Olympic Games in Atlanta

Sparked by the courageous lighting of the Olympic torch by Muhammad Ali, the Olympic games provided a most awe-inspiring display of athletic ability and competition.⁹⁶ The Games were full of surprises and countless stories. Yet, despite the

efforts of Atlanta organizers', the Games were forced to experience the contemporary ugliness of terrorism as witnessed by the Centennial Park bombing. Not since the 1972 Munich Games had the Olympics been forced to suffer such a tragedy.

On July 27, 1996, at approximately 1:25 EST, an explosion rocked Centennial Olympic Park. The FBI reported that it consisted of three pipe bombs, laden with nails and screws that tore 15 feet of fence apart and sent shrapnel hurtling as far as 100 yards. The blast killed two people and injured 111. The blast marked the first terrorist attack at an Olympics since 1972, when 11 Palestinians killed 11 Israeli athletes and coaches.⁹⁷

The Atlanta Olympics represented a security nightmare. US government officials were concerned that terrorists might converge on the heavily televised event attended by almost 2 million people, including more than 40 heads of state. Two basic threats existed. First, several groups such as American right-wingers, religious sects, breakaway ethnic groups and Arab fundamentalists may have used the Olympics to "make a point." Second, the proliferation of weapons of mass destruction and the ease to obtain them posed a significant challenge for security officials. The Tokyo subway disaster occurred one year earlier.⁹⁸

The FBI, lead agency for crisis response, worked with approximately 40 federal, state and local agencies in Atlanta to develop an operational concept for response to an incident of chemical or biological terrorism.⁹⁹ To prepare for a worst case scenario state and federal agencies conducted a series of exercises.¹⁰⁰

First, it is important to note that the Olympics represented the 'best situation' from a terrorist's point of view. Regardless of a nonstate actor's alignment, virtually every recognized nation, religion and commercial organization were present in Atlanta.

In brief, more than 16,000 athletes from 200 countries participated in the largest peacetime event since the end of World War II. Numerous heads of state, members of royalty and CEOs from Fortune 500 companies attended the Games.¹⁰¹ In short, an attack during the Olympics would cause a large number of casualties and attract great media attention.

Regardless of the non-state actor, terrorist group or “amateur terrorist,” a wide array of WMD weapons, primarily chemical and biological, were available worldwide at the time of the Centennial Park bombing.¹⁰² Consider the potential effects if a “suitcase” nuclear device, ten pounds of chemical agent or a few grams of biological toxin vice the three pipe bombs used in the Centennial Park bombing.

As noted in an earlier section, the proliferation of weapons of mass destruction is vast and dense. Several states possess stockpiles of chemical and biological agents and are known sponsors of terrorism. The threat of nuclear proliferation is gaining legitimacy as the former Soviet Union attempts to manage its aging nuclear weapon stores and monitor its technology base. The numbers of countries possessing WMD is not declining, and most likely will increase into the next millennium.

With the wide array of WMD at a terrorist’s disposal, determining the most likely terrorist threat scenario with regard to the Atlanta Olympics is a challenge. However, precedence directs attention to Aum Shinrikyo use of Sarin in the March 1995 subway attacks in Japan.¹⁰³

The Aum Shinrikyo attack highlights the key aspects of a successful, covert WMD attack. First, the attacker was able to plan in advance and select the time, place and level of the attack. Second, devices were redundant to maximize potential for

success. Third, the attacker exploited a single vulnerability with a number of other targets available should one or more become inaccessible. Lastly, delivery of the device(s) to the target area was relatively simple task, as individuals could easily operate within the crowded subway trains.¹⁰⁴ Based on the data drawn from the Centennial Park and Aum Shinrikyo attacks, it appears that terrorists were likely to employ WMD under two general scenarios.

The first scenario, the “Apocalypse Scenario,” is rooted in the idea that a non-state actor decides to use WMD because a conventional attack would not produce the desired causality numbers. While the motive and mental stability of the attacker teeters on the edge of insanity, possible reasons for an attack of this magnitude might include religious conviction or extreme hatred for established government. With respect to the Atlanta Olympics a device placed in the Georgia Dome during the gold medal men’s basketball game would have been devastating. A device, bomb or otherwise, capable of dispersing only ten kilograms of Sarin nerve agent could kill thousands in only minutes in an enclosed facility.¹⁰⁵ The use of a biological agent, delivered effectively, would be exponentially more lethal than any chemical agent. Only a few kilograms of anthrax, dispersed in the air in Centennial Park, would produce casualties on the order of magnitude of a nuclear blast.¹⁰⁶

The second scenario, the “Threat Scenario,” is founded in the theme of creating mass terror through threats. In this case the non-state actors would credibly threaten to use a WMD against the population or target group to achieve political or secular based goals or force a government to institute change. To achieve credibility the non-state actor must prove itself a legitimate threat possessing the means to inflict such casualties. This

scenario falls under the more classic themes of terrorism. Regarding the Olympics, a non-state actor might threaten to initiate an attack on the order of the “Apocalypse Scenario” at an undisclosed venue or event.¹⁰⁷

Whether chemical or biological, the employment or threat of weapons of mass destruction employed during the Olympics would have produced enormous consequences. In the event of actual use the strain on law enforcement and medical support systems might have been overwhelming. The mechanism to ensure this did not happen was the web of local, state and federal agencies tasked with the security of the Olympics. However, did this defense network possess the level of real or perceived asymmetric preparedness to deter or manage the consequences of an attack? Given the possibility of a WMD attack, what would have been the requirements concerning NBC defense to insure protection and survivability of all involved in the Atlanta Olympics?

Regarding the Olympics, selecting the “most dangerous” scenario versus the “most likely” is best for obvious reasons. Consequences are much tougher to manage than threats. Therefore, what specific requirements must be met from an NBC defense perspective to allow federal, state and local agencies to accomplish their mission in the wake of a WMD terrorist attack?

In this scenario a focus on planning and preparation with regard to detection and restoration would dramatically enhance protection of the targeted population and facilitate consequence management by law enforcement and support agencies. Officials must possess the ability to detect and identify potential hazards and effectively manage their effects.

First, with respect to the Olympics, officials must possess a mechanism that

detects possible/likely threat agents and provides early warning. Once detected and identified this information must be communicated to a command and control cell to prevent additional casualties.

A local command and control center, equipped with the appropriate staff and communications capabilities, would be required to assess the available information. Once the information has been analyzed, this cell would determine the seriousness of the incident, advise responding agencies as to a suitable course of action and direct necessary actions to contain the situation.¹⁰⁸

While complete avoidance of contamination is most desired, the probability of large numbers of contaminated casualties and inherent hazards due to such an attack is most likely. In response to a Sarin nerve agent attack in the Georgia Dome trained and competent professionals from local, state and federal agencies must be able to mitigate the consequences of up to 20,000 casualties and limit the spread of the contamination in an effort to prevent additional casualties. Medical personnel trained in identifying and treating chemical agent casualties are key in limiting the severity of such an attack.

Managing the consequences of a biological attack is less obvious. First, the symptoms or rate of action of a biological attack may not be evident upon exposure. Type of agent and extent of dosage may vary from a few hours to several days.¹⁰⁹ The paramount requirement in handling bio-agent casualties is trained first responders and medical personnel sensitive to the likelihood and consequences of a biological agent attack. The ability of first responders and medical personnel to detect such an attack, the more likely the consequences of the attack can be mitigated.¹¹⁰

It is quite clear from both case studies that the requirements to mitigate the effects

of a chemical or biological attack, at home or abroad, are extensive. However, common to each were the basic requirements to possess sufficient NBC defense capabilities to detect and identify a potential threat and mitigate its effects. Trained personnel, both military and civilian and an effective command and control system appear to be the requisites for an effective NBC defense preparedness program. Based on several estimates and government reports; however, it appears that deficiencies were prevalent in both the Gulf War and the 1996 Summer Olympics. The question remains, were these deficiencies great enough that an attack against the US be considered an asymmetric attack?

Case Study Analysis

Given the NBC defense requirements identified in the case studies and the identification of the evaluation criteria, the research question can now be satisfactorily addressed. Should an attack employing WMD against the US either in Operation Desert Shield/Storm or the 1996 Summer Olympics be considered an asymmetric attack?

Evaluation Criteria

In order to answer the research question, evaluation criteria must be established. Components of the developed definition of asymmetry, as identified in an earlier section, will serve as the criteria.

Two fundamental characteristics provided the foundation of asymmetry, preparedness and power. Preparedness was identified as the ability of a force to shield itself against a threat capability or maintain an organizational, strategic or tactical capability that provides a distinct advantage over an opponent. Power refers to a resource or technology that if possessed or developed, provides a force coercive advantage over an

opponent who lacks the ability to counter the advantage. The third component of asymmetry, one that spanned both preparedness and power, was the concept of ideology. The idea that an opponent's cultural and moral fiber permits acts of aggression that others may perceive as abhorrent and violating the global bounds of accepted behavior.

Therefore, asymmetric warfare was defined as conflict involving two opponents. One maintains the capability to strike the other and the other is either unprepared or lacking sufficient power to defend itself against that specific capability. Degrees of preparedness, power and ideology will serve as evaluation criteria for the analysis.

Analysis of Operation Desert Shield/Storm

At the onset of Iraq's invasion of Kuwait it had developed a substantial chemical weapons capability to include massive stockpiles of weaponized chemical agents, a menu of various delivery systems, and the doctrine and training to employ these weapons in conjunction with conventional fires. Iraq had also used nerve agents against Iranian troops in 1984 and by 1990 had been producing thousands of tons of blister and nerve agents annually. In addition, it was reported that Iraq developed biological agents such as anthrax and botulinum toxin. Iraq's delivery systems included ballistic missiles, aerial bombs, artillery shells, rockets and aircraft-mounted spray tanks.¹¹¹

Iraq substantial chemical and biological weapons stockpiles and Saddam Huessein's volatile rhetoric implied he was willing to use these weapons on the battlefield. Iraq most definitely maintained the coercive power potential to inflict severe damage to Coalition forces. However, it appears Saddam Hussein lacked the ideological resolve to use them. Only Saddam knows the answer. The 1995 defection of Hussein Kamel revealed that the Iraqi leadership may not have employed WMD because it feared

US nuclear retaliation.¹¹² Coalition NBC defense preparedness as interpreted by Iraq could have also contributed to Hussein's decision. However, regardless of reason, were US and Coalition forces prepared to fight on a battlefield strewn with chemical and possibly biological weapons?

At the conclusion of the Gulf War former Indian Army Chief of Staff Sundarji was reported to have said that the principle lesson of the Gulf War was that if a state decides to fight the United States, it should avoid doing so unless it possesses a nuclear capability.¹¹³ When Saddam Hussein invaded Kuwait US intelligence services had an unclear picture of the extent and maturity of Iraq's biological or nuclear programs. Despite almost 1000 Coalition air strikes against WMD facilities, UN inspectors reported destroying 40,000 chemical weapons after the war.¹¹⁴

To counter Iraq's WMD capability the Coalition forces and more specifically, US forces, relied on what was believed to be an extensive and elaborate NBC defense or preparedness posture. The US initiated a range of actions to attack known WMD sites and adopted stringent measures to limit the risk to forces in the theater. These measures were taken to warn Saddam Hussein and his forces that their interests would not be served by using WMD. However, these measures at the admission of US officials were low at the outset of the crisis.¹¹⁵ Other reports, conducted by government officials outside the military, concluded that these deficiencies continued to be low throughout the war.

The General Accounting Office reported at the close of the war that US forces were not prepared to defend against chemical and biological agent attacks. In addition, the US assumed great risk with over-reliance on post-mobilization activities to overcome

these deficiencies. Units and individuals arrived in theater without required equipment such as protective clothing and adequate biological and chemical agent detectors. Both active and reserve forces required extensive chemical and biological training before and after deployment to the Gulf. Medical response problems included inadequate equipment and training. Most troubling was the complacency and absence of command emphasis on chemical and biological defense prior to the deployment to the Gulf.¹¹⁶ Given Iraqi coercive potential and ideological posture and Coalition NBC defense preparedness, did Iraq possess an asymmetric advantage?

It is quite obvious that US nuclear deterrence dented Iraq's ideological framework and played a substantial role in Iraq's WMD employment plan during the Gulf War. Post war analysis of US NBC defense preparedness revealed glaring deficiencies that existed throughout the campaign. The order of magnitude that these possible deficiencies presented is unknown. The fact remains that Iraq did not employ chemical or biological weapons. Therefore, it appears that Iraq did not possess the sufficient coercive potential and ideological framework to provide them an asymmetric advantage, from their perspective. In this case study US rhetoric concerning inferred nuclear response may have been enough to deter Iraqi use of WMD.¹¹⁷

Analysis of 1996 Summer Olympics, Atlanta

Behind the pomp and stance of the opening ceremonies, the lighting of the torch also marked the initiation of one of the largest Olympic security missions in the history of any Olympics. The FBI along with approximately 40 federal, state and local agencies constituted a security force of over 25,000 strong. In addition to the normal security requirements of an event of this size, this force was particularly focused on two gravely

serious threats, terrorism and weapons of mass destruction.¹¹⁸ On July 27, 1996, this threat came to fruition with an explosion rocked Centennial Olympic Park.

Two possible threat courses of action were identified earlier in the paper. First, the “Apocalypse Scenario,” involved an attack founded in religious conviction or extreme hatred for established government. This attack, involving chemical or biological agents, aimed at producing casualties of enormous proportions. The second scenario, the “Threat Scenario,” was founded in creating mass terror through threats. In this case the non-state actors would credibly threaten to use a WMD against the population or target group to achieve political or secular based goals or force a government to institute change.¹¹⁹ Either scenario would require an enormous amount of crisis response or consequence management efforts. For purposes of this research focus remains on consequence management, the most resource intensive the two response actions.

To meet these threats local, state and federal agencies, coordinated by the FBI, developed a tiered system of defense against a WMD attack. First, local first-responders composed of firefighters, police and paramedics, would arrive first on the scene and local hospitals and health care workers would provide immediate care. However, not all these teams were trained or equipped to detect, identify or handle chemical warfare agents.¹²⁰ A biological agent would be even tougher to handle for these teams.

At the state level the governor had the option to call up National Guard assets to provide medical, decontamination and general support in the event of an emergency. Again, most of these assets were not trained or equipped to handle an emergency of this magnitude. It was likely that terrorist use of such a weapon would have overwhelmed the capabilities of both local and state governments.¹²¹

While local and state consequence management agencies appear to have exhibited deficiencies in their ability to meet a WMD attack, federal agencies and teams appear to have been no better prepared. Federal agencies including the FBI and DOD deployed hundreds of chemical and biological agent experts close to Atlanta. The Marine Corps stood up the newly formed Chemical Biological Incident Response Force (CBIRF), composed of 300 Marines and sailors specially trained to provide decontamination, medical and security support to local agencies. CBIRF deployed to the Atlanta Games to provide support.¹²² In addition to CBIRF, the US Army's Technical Escort Unit (TEU) and Metropolitan Medical Strike Teams (MMST) were prepared to provide immediate assistance in the aftermath of a WMD attack.¹²³ Lastly, the federal government established a science and technology center in Atlanta designed to identify a chemical or biological agent and decide how to react to it.¹²⁴

The bomb explosion on 27 July 1996 provided no test for the consequence management system. While first responders arrived on the scene and assessed that the bomb had no WMD characteristics, state and federal teams assessed possible consequence management options.¹²⁵ It is still unknown whether or not this collection of local, state, and federal agencies could have responded to an attack and sufficiently mitigated its effects.

Despite the Herculean efforts by local, state and federal agencies to prepare to respond and manage the consequences of a chemical or biological attack, it is evident that the Atlanta Olympics remained extremely vulnerable. As late as a month prior to the start of the Olympics FEMA announced to the President that there were serious deficiencies in consequence management capabilities at local and state levels, the

critically important and manpower intensive first responders.¹²⁶ At the federal level, the capabilities of CBIRF were unknown, as the unit had just been activated in April 1996. Finally, first responders lacked the emergency health and medical services to manage the primary challenge a WMD attack, mass casualties.¹²⁷ It is evident that a chemical or biological attack could have overwhelmed local medical capabilities and wrecked the entire consequence management system, creating a considerable preparedness void. Therefore, if a non-state actor possessed the ideological orientation to conduct a chemical or biological attack during the 1996 Summer Olympics it would be considered asymmetric because local, state and federal agencies were unprepared to defend against such an attack.

Conclusion

The use of weapons of mass destruction, conventionally or unconventionally, poses a significant challenge to the US government and military. The threat is not new and is gaining popularity as the world moves into the next millennium.

The United States maintains an unquestionable technological advantage over the rest world. However, this may not be enough to protect the nation's interests or win the next war. United States' strengths, as well as weaknesses, are well known to potential adversaries. Therefore, the US must believe that potential adversaries are looking for ways to launch the Clausewitzian "slight blow" or asymmetric attack.

Asymmetric warfare was denoted conflict involving two opponents where one maintains the capability to strike the other, unprepared or lacking sufficient power to defend itself against that specific capability. Paramount for any nation to prepare itself for asymmetric warfare is governments' ability to quickly respond and effectively handle

the perceived threat. For this particular study US ability or NBC preparedness to respond to both military and domestic WMD incidents constitute the value of its readiness.¹²⁸ The perception that a nation is prepared and maintains the ability to respond weighs heavily in the minds of the potential adversary, contemplating use of asymmetric means. Therefore, it is vitally important to the defender to identify what provides the attacker a viable asymmetric advantage with respect to WMD. The defender can then ensure appropriate measures are taken to mitigate this threat, creating asymmetric preparedness.

A study of Operation Desert Shield/Storm and the 1996 Summer Olympic Games in Atlanta proved beneficial in obtaining a realistic view of US preparedness against a WMD attack. The study revealed that even though US NBC defense preparedness possessed glaring deficiencies, Iraq believed it did not possess sufficient coercive potential and the ideological framework to gain an asymmetric advantage. Domestically, a study of the 1996 Summer Olympic Games identified unprepared local, state and federal agencies with respect to managing consequences of a WMD attack.

The case studies noted deficiencies in US NBC defense preparedness posture. However, several initiatives and programs are underway that are aimed at increasing US NBC defense preparedness, both militarily and domestically. Analysis by the GAO revealed that, while greater diligence is needed to achieve sufficient protection for America's armed forces, the Department of Defense is moving in the right direction.¹²⁹ Domestically, Congressional and Presidential direction of the Domestic Preparedness Program is aimed at training and preparing critical first responders in 120 major cities nationwide, a program that will prove invaluable in the years ahead.¹³⁰ While the United States is not completely prepared to defend against the inherent asymmetry of WMD, it

has identified shortcomings and initiated actions to improve NBC defense preparedness.

It is only a matter of time before the US will possess the ability to “move from a fencer’s position to that of a wrestler.”¹³¹

¹ Carl von Clausewitz. *On War*, ed. And trans. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1976), 219.

² John P. Sinnott, “It was the Algerian and Canadian soldiers at Ypres who suffered history’s first major poison gas attack,” *Military History*, April 1994, 12.

³ Bernard and Fawn M. Brodie, *From Crossbow to H-Bomb* (Bloomington: Indiana University Press, 1973), p. 15-16.

⁴ Sonnett, 12.

⁵ Charles E. Heller, *Chemical Warfare in World War I: The American Experience, 1917-1918, Leavenworth Paper 10*, (Leavenworth: Combat Studies Institute, 1984), 91.

⁶ Charles J. Dunlap, *Preliminary Observations: Asymmetrical Warfare and the Western Mindset*, ed. Lloyd J Mathews. *Challenging the United States Symmetrically and Asymmetrically: Can America Be Defeated*, (Carlisle Barracks, PA: Strategic Studies Institute, July 1998), 5.

⁷ John F. Guilmartin, Jr., *Technology and Asymmetries in Modern Warfare*, ed. Lloyd J Mathews. *Challenging the United States Symmetrically and Asymmetrically: Can America Be Defeated*, (Carlisle Barracks, PA: Strategic Studies Institute, July 1998), 25.

⁸ Dunlap, 1.

⁹ Sun Tzu. *Art of War*, ed. and trans. Ralph D. Sawyer (Boulder, CO: Westview Press, Inc., 1994), 134.

¹⁰ Williamson Murray, “Thinking About Revolutions in Military Affairs,” *Joint Force Quarterly*, Summer 1997, 69.

¹¹ Ibid, 70.

¹² Ibid, 71.

¹³ Ibid, 71.

¹⁴ The White House. *National Security Strategy for a New Century*, October 1998, 22.

¹⁵ Lloyd J. Mathews, *Symmetries and Asymmetries-A Historical Perspective, Challenging the United States Symmetrically and Asymmetrically: Can America Be Defeated*,

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¹⁷ Thazhakuzhyil Varkey Paul, *Asymmetric Conflicts: A Study of War Initiation by Lesser Powers*, UCLA, 1991, 52.

¹⁸ Christopher R. Mitchell, *Asymmetry and Strategies of Regional Conflict reduction, Cooperative Security: Reducing Third World Wars* ed. I. William Zartman and Victor A. Kremenyuk, (Syracuse: Syracuse University Press, 1995), 26.

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²⁰ Dunlap, 3-4.

²¹ Mitchell, 29.

²² Ibid, 36.

²³ Stephen Sloan, *Terrorism and Asymmetry*, ed. Lloyd J Mathews. *Challenging the United States Symmetrically and Asymmetrically: Can America Be Defeated*, (Carlisle Barracks, PA: Strategic Studies Institute, July 1998), 190-191.

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²⁵ David Ochmanek, "Time to Restructure US Defense Forces," *Issues in Science and Technology*, Winter 1996-1997, 36.

²⁶ Ibid, 37.

²⁷ Joint Chiefs of Staff, *Joint Vision 2010*, (Washington DC: The Joint Staff, 1998), 10-11.

²⁸ Joint Chiefs of Staff, *Joint Pub 1, Joint Warfare of the Armed Forces of the United States*, (Washington DC: The Joint Staff, 19 Jan 1995), IV-10-11.

²⁹ Joint Chiefs of Staff, *Joint Pub 3-0, Doctrine for Joint Operations*, (Washington DC: The Joint Staff, 1 February 1995), III-10.

³⁰ U.S. Army, *FM 100-5, Operations, Revised Final Draft*, (Washington DC: Department of the Army, June 1998).

³¹ Richard A Falkenrath, Robert D. Newman, & Bradley A. Thayer, *America's Achilles' Heel*, (Cambridge, MA: The MIT Press, 1998), 218.

³² Dunlap, 6.

³³ Joint Pub 3-0, I-3.

³⁴ Falkenrath, Newman, & Thayer, 253.

³⁵ Edmund M. Gladus, *Metaphors and Modern Threats: Biological, Computer and Cognitive Viruses*, ed. Lloyd J Mathews. *Challenging the United States Symmetrically and Asymmetrically: Can America Be Defeated*, (Carlisle Barracks, PA: Strategic Studies Institute, July 1998), 209-210.

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⁴³ Brown, p. 8.

⁴⁴ Stephen J. Blank, *How Will We Lose the Next War with Russia: A Critique of US Military Strategy*, ed. Lloyd J Mathews. *Challenging the United States Symmetrically and Asymmetrically: Can America Be Defeated*, (Carlisle Barracks, PA: Strategic Studies Institute, July 1998), 252-3.

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- ⁴⁹ Brodie and Brodie, 14-15.
- ⁵⁰ Ibid, 194.
- ⁵¹ Ibid, 193.
- ⁵² John Giles, *Flanders Then and Now; the Ypres Salient and Paschendaele* (London: Plaistow Press Ltd, 1987), 57.
- ⁵³ Sonnett, 81.
- ⁵⁴ Ian V. Hogg, ed. *The Encyclopedia of Weaponry* (London: Guinness Publishing, 1992), s.v. "Gas Warfare."
- ⁵⁵ Brodie and Brodie, 195.
- ⁵⁶ Ibid, 195.
- ⁵⁷ Giles, 59.
- ⁵⁸ Brodie and Brodie, *From Crossbow to H-Bomb*, 195.
- ⁵⁹ James Kendall, *Breathe Freely! The Truth About Poison Gas*, (London: G. Bell & Sons Ltd., 1938), 47.
- ⁶⁰ Giles, *Flanders Then and Now*, 59.
- ⁶¹ Valerie Adams, *Chemical Warfare, Chemical Disarmament* (Bloomington: Indiana University Press, 1990), 16-17.
- ⁶² Vogel, 2.
- ⁶³ Ibid, 65-66.
- ⁶⁴ Ibid, 69.
- ⁶⁵ Ibid, 2-3.
- ⁶⁶ Adams, 73-74.
- ⁶⁷ Ibid, 86-87.
- ⁶⁸ Vogel, 2-3.
- ⁶⁹ Department of Defense, *Conduct of the Persian Gulf War, Final Report to Congress*, (Washington DC: Department of Defense, April 1992), Q-2.
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⁷² Tim Otter, "NBC Defense in a Changing World," *Military Technology*, vol XX, issue 12, 1996, 35.

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⁷⁵ *Proliferation: Threat and Response*, 4-8.

⁷⁶ *Ibid*, 29.

⁷⁷ *Ibid*, 30.

⁷⁸ Barbara Starr, "Saddam Brings US Face-to-Face with Asymmetric Warfare," *Jane's Defence Weekly*, 11 February 1998, 19.

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⁸¹ *Ibid*, 41-48.

⁸² Falkenrath, Newman, and Thayer, p. 167.

⁸³ Federal Bureau of Investigation, *Terrorism in the United States 1995*, US Department of Justice (Washington DC: FBI, 1996), <http://www.fbi.gov> ; accessed 2 March 1999.

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⁸⁵ Ralph G. Wooten, MG, "Chemical Corps and NBC Operations Future," *Military Review*, (September-October 1996): 75-76.

⁸⁶ Stanton, 43.

⁸⁷ Robert W. Chandler, *The New Face of War*, (McLean, VA: Amcoda Press, 1998), 199.

⁸⁸ *Conduct of the Persian Gulf War: Final Report to Congress*, Q-1.

⁸⁹ *Ibid*, Q-3.

⁹⁰ *Proliferation: Threat and Response*, 31. Iraqi delivery systems included artillery, rockets, mortars, spray tanks, aerial bombs and SCUD-type missiles.

⁹¹ Chandler, 212.

⁹² Ibid, 214.

⁹³ Adams, 89.

⁹⁴ Conduct of the Persian Gulf War: Final Report to Congress, p. Q-3.

⁹⁵ Philip Finnegan, "Saddam's Bio-Chem Arsenal Could Snarl U.S. Gulf Plans," *Defense News* (September 30-October 6, 1996), p. 49.

⁹⁶ Richard Hoffer, "Atlanta '96," *Sports Illustrated*, August 13, 1996, 8.

⁹⁷ Associated Press, "Key Facts About the Explosion in Centennial Olympic Park," in Nando.net; available from <http://cgi2.nando.net/newsroom/nt/727keyfacts.html> ; Internet; accessed 2 March 1999.

⁹⁸ Tom Morganthau, "A Shadow Over the Olympics," *Newsweek*, May 6, 1996, 34.

⁹⁹ Jonathan B. Tucker, "National Health and Medical Services Response to Incidents of Chemical or Biological Terrorism," *The Journal of the American Medical Association* (August 6, 1997): 362. Two definitions must be identified. Crisis response refers to actions where the perpetrators of an attack have been identified before actual release. Domestic crisis response is the responsibility of the FBI while the Department of State is accountable for overseas incidents. Consequence management refers to actions to alleviate the effects of a chemical or biological attack. Responsibility for consequence management of WMD rests with FEMA for domestic incidents and the Department of State for overseas incidents.

¹⁰⁰ Douglas Pasternack, "Let the Games Begin," in *U.S. News Online*, available from <http://www.usnews.com/usnews/issue/24oly.htm> ; Internet; accessed 2 March 1999. One exercise presented law enforcement agents with a terrorist scenario that involved the discovery of a radiological explosive device at the Georgia Dome, the host of basketball and gymnastics competitions. Another exercise, code named Olympic Charlie, involved the release of VX nerve agent.

¹⁰¹ Congress, Senate, Committee on the Judiciary, *The Olympics and the Threat of Terrorism*, 104th Cong., 2nd sess., 11 June 1996, 11.

¹⁰² Falkenrath, Newman, and Thayer, p. 199. Amateur terrorist is a term used to describe non-state violence committed by ad hoc collections of like-minded people who come together for specific purposes, sometimes to commit a single attack.

¹⁰³ Chandler, p. 191. On the morning of March 20, eleven plastic pouches containing liquid Sarin (non-persistent nerve agent) were placed on five separate subway trains. To maximize the effects of the attack, all five trains were due to arrive at the Kasumigaseki station in the center of Japan's government district at rush hour. As a result of the attack twelve people died and more than 5,500 were injured.

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- ¹⁰⁴ Falkenrath, Newman, and Thayer, p. 138-39.
- ¹⁰⁵ U.S. Army, *FM 3-9, Potential Military Chemical/Biological Agents and Compounds*, (Washington DC: Department of the Army, 12 December 1990), 19.
- ¹⁰⁶ Chandler, 189.
- ¹⁰⁷ Falkenrath, Newman, and Thayer, 206.
- ¹⁰⁸ Ibid, 301.
- ¹⁰⁹ FM 3-9, 12.
- ¹¹⁰ Joan Stephenson, "Confronting a Biological Armageddon: Experts Tackle Prospect of Bioterrorism," *JAMA*, (August 7, 1996): 5.
- ¹¹¹ *Conduct of the Persian Gulf War: Final Report to Congress*, Q-3.
- ¹¹² Robert G. Joseph and John F. Reichert, *Deterrence and Defense in a Nuclear, Biological and Chemical Environment*, (Washington DC: National Defense University Press, 1995), 4.
- ¹¹³ Ibid, p. 23; *Proliferation: Threat and Response*, p. 29.
- ¹¹⁴ U.S. Department of the Air Force, *Gulf War Air Power Survey: Summary Report*, (Washington, DC: Government Printing Office, 1993), 80-81.
- ¹¹⁵ *Conduct of the Persian Gulf War: Final Report to Congress*, Q-2 - Q-3.
- ¹¹⁶ General Accounting Office, *Chemical and Biological Defense: Emphasis Remains Insufficient to Resolve Continuing Problems*, Letter Report 1, Washington DC: GOA, March 29, 1996).
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- ¹¹⁸ 104th Cong., 2nd sess., 1.
- ¹¹⁹ Falkenrath, Newman, and Thayer, 206.
- ¹²⁰ Tucker, 2.
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¹²⁵ Chris Seiple, "Consequence Management: Domestic Response to Weapons of Mass Destruction." *Parameters* (Autumn 1997): 6.

¹²⁶ US Federal Emergency Agency, *Terrorism Incident Annex to Federal Response Plan*, (Washington, DC: FEMA, February 7, 1997), 12.

¹²⁷ Ibid, p. 12.

¹²⁸ Brown, p. 8.

¹²⁹ Mark E. Gebicke, *Chemical and Biological Defense: Observations on DOD's Plans to Protect U.S. Forces*, United States General Accounting Office, (Washington DC: GAO, March 17, 1998), 8-9.

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¹³¹ Clausewitz, 219.

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